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GEOPHYSICAL ABSTRACTS

NO. 10.

BY

F. W. LEE

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DEPARTMENT OF COMMERCE -- BUREAU OF MINES

GEOPHYSICAL ABSTRACTS[1]

No. 10

Compiled by Frederick W. Lee [2]

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1 - GRAVITATIONAL METHODS

ZUR BESTIMMUNG VON LAGE UND AUSDEHNUNG EINFACHER MASSENFORMEN UNTER VERWENDUNG VON GRADIENT UND KRÜMMUNGSGRÖSSE

(DETERMINATION OF THE POSITION AND EXTENT OF SIMPLE BODIES BY USE OF THE GRADIENT AND CURVATURE VALUES

By Karl Jung

Zeitschrift fuer Geophysik, vol. 5, Nos. 5 and 6, 1929, pp. 238-252.

This paper is an addition to the work of the author which appeared in vol. 3, (1927) of the Zeitschrift fuer Geophysik. (See Geophys. Abs. 2) Methods are derived for the determination of the position and extent of simple bodies from the gradients and curvature values measured by the Eötvös torsion balance. The knowledge of the density difference of the deposit as compared with its surrounding bodies is assumed. The methods deal only with the so-called "two-dimensional" deposits; that is, deposits having the shape of a horizontal cylinder or prism greatly extended.

Examinations are made of deposits having a square section and situated perpendicularly, such as the perpendicular faults and symetrical anticlines and synclines.

The last section contains approximate formulas for small gradients of inclined bodies, anticlines, and synclines. An example of a gradient that may be considered small in amount is given (in case of a careful use of the curvature value to about 15°).--Author's abstract, translated by W. Ayvazoglou.

DIE GRAVIMETRISCHEN VERFAHREN DER ANGEWANDTEN GEOPHYSIK

(THE GRAVIMETRIC METHOD OF APPLIED GEOPHYSICS)

By Hans Haalck

Mainka's Sammlung Geophysikalischer Schriften, Nr. 10,
Gebrüder Borntrager, Berlin, 1929, 205 pp.

The contents of this book comprise: Historical development of gravimetric measurements and the position of gravimetric methods among the geophysical methods of prospecting; properties of the potential and of level surfaces; measurement of the variation of the direction and intensity of gravity, chiefly a description of the pendulum method; measurement of the gradient and differential curvature with the torsion balance; the theory, and description of the Eötvös torsion balance; analyses of the results of torsion-balance surveys, the effect of topographic irregularities, graphical calculation of the terrane effects, construction of isogams, calculation of deflection of the vertical, anomalies produced by special types of subsurface bodies, diagrams as an aid to the interpretation of torsion-balance surveys, theoretical relation between gravimetric and magnetic measurements; physical-geological evaluation of observed gravity anomalies, general discussion, specific gravity of different types of rocks, practical examples, mine surveys, surveys of ore deposits, Kursk as an example of relation between gravity and magnetic anomalies; field of applicability and future potentialities of the gravimetric method of exploration.

This book, although uninspired and rather elementary, is a creditable, well-rounded, fairly well-balanced summary of the main points of the gravimetric method of prospecting. It is written in Haalck's usual easy German and easily-followed flow of thought. The mathematical discussion is in simple terms of simple calculus. More advanced exposition of the torsion-balance method and more elementary statement of the mathematical theory of the torsion balance is available in English. Although mostly listed in the bibliography, the extensive series of English and American papers on the torsion balance seemingly had not become available to the author before the publication of this book.

Some statements are not according to the reviewers experience: For the study and analyses of faint anomalies, more exact methods of adjustment than that given by the author are necessary, and the least-square adjustment of a primary net of lines is faster and, on many surveys, less wearing on the disposition; in a few cases, a simultaneous least-square adjustment of all stations gives a worth-while increase in accuracy. Isogams usually rather than occasionally are of value in interpretation, except in simple situations. Maps showing equal value of U_{xy} and $U_{\triangle}$ commonly also are of value. Graphical calculation of the terrane correction such as described by Haalck, although superior to the analytical calculation, is too slow compared to yet other methods for routine work. The assumption of infinite extent at right angles to the vertical plane of the section is not permissable for many types of structures, but graphs similar to Haalck's charts, Figures 70-c and -d, with prisms of finite length are easily constructed and as easily used as the "infinite" charts. For structures without an axis of symmetry, various types of "contour" methods are available. The positive gravity anomaly characteristic of the Gulf Coast salt domes is not due solely to specific gravity of the unconsolidated Plio-Pleistocene sediments lower than that of the salt and is present on shallow domes where no cap rock is present. The maximum number of stations which is possible per day per torsion balance is not three, but five--at least with Süss visual instruments and not less than five readings, with favorable terrane, and with station intervals of 1 kilometer of less.--Donald C. Barton.

THE EÖTVÖS-RYBAR AUTOMATIC TORSION BALANCE

(Source of information not given)

Professor Dr. Stephen Rybar, formerly first assistant of Baron R. Eötvös and now director of the Physical Institute at Budapest constructed a new small-type automatic registering torsion balance.

The Eötvös-Rybar torsion balance can be used both for automatic registration or visual observation day and night under most unfavorable weather conditions. Both the gradients and horizontal directing tendencies will be determined nearly with the same accuracy. The time between each observation is 40 minutes.

Visual observation will be made by the aid of an arm with telescopes and scales. The arm can be easily removed or replaced on the balance.

In automatic registration the turning of the balance in different azimuths is made by the strong spring the clockwork placed in a dustproof box in the lower part of the balance. The first impulse of movement is given by contact clockwork. This is not built in the instrument itself but in a separate box simply placed below the balance and connected to it by a wire. The whole mechanical part of the instrument can be easily removed and cleaned or replaced by spare clockwork in a few minutes.

The slide containing the photographic plates placed in the lower part of the instrument moves with turning the balance itself. It is therefore impossible for the balance to turn or for the plate to get stuck. By pressing a button the slide and the whole optic system can be removed for adjustment or cleaning.

The torsion wire is made of special material with high tensile strength and low torsion resistance. An increase of sensitiveness of the torsion balances, however, was found unnecessary, the properties of the torsion wire have been used for shortening their length and the length of the beam. The wire with a diameter of 0.01 mm, is strong enough to carry the weight of 56 grams.

Characteristic constants of an Eötvös-Rybar torsion balance: Constant of sensitiveness for directing tendency: 57.10^3 c.g.s. units; for gradients: $\frac{mhl}{t} = 87.10^3$ c.g.s. units.

Length of torsion wire	200 mm.
Diameter of torsion wire	0.01 mm.
Length of torsion arm of the beam	70 mm.
Size of photographic plate	4, 5x6 cm.
Time required for each observation	40 min.
Total height of instrument without tripod	820 mm.
Total height of instrument with tripod	1,460 mm.
Weight of instrument with tripod	35 kg.
Weight of telescope arms	3.7 kg.

-- O. Weiss.

GRAVITY OBSERVATIONS IN THE SOLIKAMSK AND BEREZNIAKY DISTRICTS IN THE NORTHERN URALS IN 1926 AND 1927

By B. Numerov

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 251-265.

In this article Numerov describes the gravity surveys made for the purpose of establishing the underground salt relief situated among known boreholes. The region was investigated during 1926 and 1927 by several parties. Bamberg-Schweydar's variometers have been used and about 700 stations measured.

The results of gravity observations are shown in three maps and the depth h of the salt-bearing mass and marks of $\triangle g$ taken from the maps are given in a table. The table shows a very close connection between the gravity anomalies and the depth of the salt. Maximum anamoly corresponds to the sinking of salt and minimum to the rising of it. This dependence is shown graphically in a figure.

The full agreement of the gravity survey results with those obtained by boring may serve as the best argument in favor of the application of the gravitational method of prospecting in this district.--W. Ayvazoglou.

RESULTS OF GRAVITY OBSERVATIONS OF 1928 NEAR LAKE BASKUNCHAK

By B. Numerov.

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 265-268

The present paper contains data of gravity observations near the lake of Baskunchak (250 km. to the north of Astrakhan). An area of about 1,600 square kilometers has been investigated. Two Schweydar-Bamberg torsion balances (Nos. 533 and 562) were used. Investigation was made of 268 points, situated about 300 meters apart; in regions with a strong anomaly developing steadily over a vast area a route survey with points of 3 to 5 kilometers was investigated. In a figure showing the anomaly of gravity near Lake Baskunchak, the values and directions of the greatest changes are given. The observed anomaly can not be explained by corrections for isostasy and depends entirely on the geological structure of the nearest earth strata (to 10 km. in thickness).

In conclusion, Numerov draws attention to the necessity of pursuing gravitational work which should be conducted by means of pendulums over wide areas, the details being perfected by the torsion balance measurements.--W. Ayvazoglou.

RESULTS OF THE GENERAL GRAVITY SURVEY IN THE EMBA DISTRICT

By B. Numerov

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 268-270

The paper contains the results of a general gravity survey executed within the area of the petroliferous deposits Dossor and Iskine, Emba district, near the northeastern coast of the Caspian Sea. Observations were made by Schweydar-Bamberg variometer and one Bamberg pendulum. A test of a rapid route survey with stations through every 3 or even 5 kilometers, under the conditions of gravity anomaly in the Emba district, proved to be successful; a series of intermediate gravity minima (domes) between the main minima at Dossor and Iskine was established by 62 stations. Summarized results are given in a map.

The periodical distribution of gravity anomalies is, according to Numerov, characteristic for the northeastern coast of the Caspian Sea, or even for the whole Caspian region; thus he draws the conclusion that the general gravimetric survey of the Caspian region should consist of (1) a route survey with variometers through large intervals; (2) pendulum observations at discovered points of gravity minima, and (3) a study of more interesting areas from the practical standpoint.--W. Ayvazoglou.

RESULTS OF GRAVITATIONAL OBSERVATIONS IN THE REGION OF GROZNY IN 1928

By B. Numerov

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 271-275.

This paper discusses the observations undertaken in the region of Grozny to establish the possible anticline fold sunk in the sediments north of the Tersky Ridge. Four Bamberg torsion balances were used, and 802 points in total were observed. The observations were conducted in two parallel lines, and points 250 to 500 meters apart were selected. The total length of the profile completed reached about 200 kilometers. The direction of the profile is shown in a map. From the data obtained, Numerov draws the conclusion that to solve the problem of detecting the buried anticline north of the Tersky Ridge, the observed curve of gravity ought to be corrected for the influence of "deep geology" (original influence), utilizing for this purpose the pendulum observations along the profile under investigation. The results obtained proved, in the opinion of the author, the great importance of pendulum observations, not only for the solution of general geophysical problems but also for the purely utilitarian purposes of geological survey.

Tables showing (1) the anomalies of gravitation in 0.001 centimeter-second $^{-2}$ and (2) results of pendulum observations in North Caucasus in the region of Grozny in 1928 are added to the article.--W. Ayvazoglou.

RESULTS OF GRAVIMETRIC OBSERVATIONS ON THE SHUVALOVO LAKE IN THE WINTER OF 1927 AND 1928

By B. Numerov

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp.276-289

Two series of Experimental investigations were carried out on the Shuvolovo Lake, near Leningrad, to prove the value of the gravitational method of prospecting and the possibility of establishing the relief of the bottom according to the data obtained solely by a gravitational survey. The data has been checked by soundings.

The first series in 1927 and the second in 1928. Fifty-nine points were observed in 1927 with the large Schweydar-Bamberg variometer No. 92 and 189 points in 1928 with the small Bamberg variometer No. 533. From comparison of observations of the first and second series taken a year apart with different instruments at 23 common points, the mean error of one gradient V_{xz} and V_{yz} proved to be equal to $\varepsilon = \pm 2 \times 10^{-9}$.

Two tables showing the results of observations are given.

The instruments were mounted upon three bricks symmetrically laid on ice. Special sledges were constructed for driving the pavilion from one station to the other. Three stations (some days five) were observed per day. The Bamberg variometers worked satisfactorily in spite of the low temperature, which sometimes reached -32°C.

The contour lines of the bottom of the lake (isobaths) drawn at every meter, with depth marks in decimeters, are given in a figure. Another figure shows the plan of vectors of gravity variations; lines of equal anomaly (isogams) are drawn through every 5 x 10^{-5} centimeters $^{-2}$. A map of curvature gradients is given in the third figure. Comparing the maps of isograms with that of depths an almost complete identity may be seen. In the last part of the article Numerov derives formulas by which the anamolies of $\triangle$ g may be compared with the h.--W. Ayvazoglou.

2 - MAGNETIC METHODS

MAGNETOMETER STUDY OF ALABAMA AREA

By L. Spraragen

The Oil and Gas Journal, vol. 28, No. 33, 1929, pp. 37, 64-66

The values used in contouring the magnetometer maps of the Alabama area submitted with this article are based on the United States Coast and Geodetic Survey.

For this reason the maps do not show detailed structure. However, these general maps are very valuable for anyone doing magnetometer work in this State. By using these maps as a guide any small area that has been detailed can then be viewed with relation to the large general features.

For additional magnetometer work these general maps will also be found of great value in determining beforehand what the relief will be so that the instruments can be adjusted at the start if necessary.

Attention is called to those magnetometer features that occur in the areas that are favorable from the geological standpoint, for where a magnetic high occurs in a region that is favorable for oil accumulation, it should prove interesting to make a detailed study of the area with the magnetometer and use the findings in connection with the geological study of the area.--W. Ayvazoglou.

DIE MAGNETISCHE AUFNAHME DER OSTSEE MIT DEM EISENFREIEN SCHIFF "CECILIE"

(MAGNETIC MEASUREMENTS OF THE BALTIC SEA WITH THE IRON-FREE SHIP "CECILIE")

By M. Grotewahl

Zeitschrift fuer Geophysik, vol. 5, Nos. 5 and 6, 1929, p. 255

Taking into consideration the highly significant work of the nonmagnetic ship "Carnegie" and the importance of magnetic measurements of the Baltic Sea, Esthonia has built the sailing ship "Cecilie," which practically is iron-free. Measurements of declination and horizontal and vertical intensities are made. The apparatus used consists of:

1. Plath's compass for measuring declination.
2. Biddlingmeyer's double compass, which proved to be very suitable for the determination of horizontal intensity under difficult conditions.
3. A vertical device, constructed specially, in which a system of needles swinging about a horizontal axis can be placed at right angles to a magnet when the latter is approached in a vertical direction (a modified Russian vertical deflector.)

Measurements have been made since 1927, and the magnetic maps of the Baltic Sea, especially of the Finnish and Bothnian Gulfs and the Bay of Riga, have been considerably improved.--W. Ayvazoglou.

MAGNETIC COMPASSES IN WELL SURVEYING

By Frank Rieber

The Oil and Gas Journal, vol. 28, No. 29, 1929, pp. 143-146 and 190-191

In this article Rieber discusses the results of his researches on the possibility of using the magnetic compass as a means for making surveys in boreholes.

He believes that the discrepancies in actual use can be completely accounted for by the failure on the part of the users to recognize the nature of the instrument with which they were dealing and the possible influence of its surroundings upon the accuracy of the results.

The principles of the new type are explained.--W. Ayvazoglou.

MESSUNG LOKALER ERDMAGNETISCHER ANOMALIEN ZUR BESTIMMUNG DES GESTEINSMAGNETISMUS IM FELD UND ZUR VERGLEICHUNG MIT DEM HANDSTÜCK; BESCHREIBUNG EINES VARIOMETERS FUER DEN ERDMAGNETISCHEN VEKTOR.

(THE MEASUREMENT OF LOCAL EARTH-MAGNETIC ANOMALIES FOR THE DETERMINATION OF MAGNETISM OF ROCKS IN THE FIELD AND FOR THE COMPARISON WITH SAMPLES; THE DESCRIPTION OF A VARIOMETER FOR THE DETERMINATION OF THE EARTHMAGNETIC VECTOR.)

By J. Koenigsberger

Gerlands Beiträge zur Geophysik, vol. 23, No. 3, 1929, pp. 248-268.

The vertical intensity was measured in three granite massives. The local anomalies were due: (1) to topographic effects, and (2) to the varying susceptibility to local or regional magnetic differentiation of the granite. The effects of (2) are of the same order as of (1), as was shown theoretically and proved by observations. The topographic effects of induced magnetism are dependent on the topographic form of the earth surface, but an approximate average value can be deduced with a possible error of ± 20%, namely for the difference (a) mountain against steep valleys maximal = 15 K Z; (b) for a vertical wall (e. g., stone quarries) against plain = - 4 K Z; (c) for a hole surrounded on nearly all sides by rock = - 8 KZ. Z is known and - K was observed on samples of the rock. The calculated effect, therefore, can be compared with the observed. In one granite (Aare massif) the largest difference for (a) given by observations was about 20 - 30 γ ; K observed (average value of specimens) was 3 . 10^{-5}; Z is now about 0.4 c.g.s., and therefore the difference calculated about 20 γ . -- In another granitic massif (Gotthardpass) the average difference for a), not the maximal, was observed equal to 12 γ ; the average K was found on specimens 15 - 20 . 10^{-5}. Therefore (a) calculated about 10 - 15 γ . The topographic effects can thus be approximately explained by induced magnetism, and the same is true of other rocks massifs. Conformably the remanent magnetism of these alpine, partly crushed and metamorphised granites was found by direct observations to be relatively weak. The remanent magnetism of some normal granites of Germany of the same susceptibility is larger.

On the wall of stone quarries in a gneiss region, where Z was measured a year before, the whole variation of Z, H, δ was now observed. Z was in accordance with the value found before. H and δ were found to be also affected by the topography. The variometer used for determination of the variation of Z, H, δ and of the absolute value δ and H and for measuring the susceptibility K of rock specimens is described. Two magnetic profiles of Z from one alpine massif to the next through a region of an alpine tectonic line of first order were observed; no special magnetic variation was found. The same was true for some minor tectonic lines in the Rheintalgraben near Freiburg im Breisgau.--Author's abstract.

DIE GRÖSSENORDNUNG DER LOKALEN MAGNETISCHEN VARIATION UND DIE METHODOLOGIE DER MAGNETISCHEN AUFNAHMEN

(THE ORDER OF VALUES OF THE LOCAL MAGNETIC VARIATIONS AND THE METHOD OF THE MAGNETIC SURVEY

By Boris Weinberg

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, p. 321

The author draws attention to the overestimation of the accuracy of measurements required during the magnetic survey and to the underestimation of the desired distance between the observation points. Several investigations to determine the order of values of these variations have been made by the author with Cyril Weinberg in Russia. The author expects to publish the results of his investigations in this magazine after the data is completed.--W. Ayvazoglou.

HANDBOOK OF MAGNETIC SURVEY (IN RUSSIAN)

By N. V. Rose and N. Trubiatchinsky

Issued by the Geophysical Observatory in Leningrad, 1928

The constant development of magnetometric work and the great need of instructions for making magnetic measurements in the field were the reasons for the publication of this handbook.

In describing the methods of taking magnetic measurements, the authors also tried to give briefly the theory of the methods in order to make possible a clear understanding of all the operations carried out during the magnetic measurements. A description of the instruments used, as well as schemes of observations, are included in the book, which is published in Russian.--W. Ayvazoglou.

MAGNETOMETER PRACTICE IN THE FIELD

By William M. Barret

The Oil and Gas Journal, Oct. 10, 1929, pp. 148-150 and 245-252.

Barret analizes the causes for nonuniformity of the results of magnetometric observations. He divides the principal sources of errors occurring in magnetic exploration work into two main groups: (1) Errors of interpretation; and (2) observational errors, or errors associated with the field measurements. Only the second group of errors is examined by the author in this article.

The article is divided into the following headings:

1. Magnetometer Characteristics:
    (a) General.
    (b) Scale-value.
    (c) Temperature coefficient.
2. Distance measurements.
3. Location of stations.
4. Instrument set up.
5. Corrections.
6. Computation of data.
7. Miscellaneous.

All the headings are discussed by the author in great detail, and a series of explanatory figures is added. In conclusion Barret draws attention to the fact that some magnetometer operators try to record as great a number of readings as possible within a day's time, although it should be remembered that, for example, 20 accurate readings per day are always preferable to 40 questionable readings. The instrument crew can assist in solving the difficult task of interpreting the magnetic data only by furnishing data upon which absolute reliance may be placed.--W. Ayvazoglou.

3 - SEISMIC METHODS

THE MINTROP SEISMIC METHOD

By Ernest H. Neville

Oil News, London, vol. 26, No. 877, Sept. 20, 1929, pp. 276, 283, 284;
Journal of the Institution of Petroleum Technologists,
vol. 15, No. 76, 1929, pp. 569-573

In this article Neville gives a brief summary of principles and application of the seismic method as developed by Prof. Dr. L. Mintrop. The arrangement of the instruments for registering the seismograms and a sketch of such a seismogram is given in two figures. In a third figure a diagram showing the theory of computation is drawn. In conclusion the author cites some typical examples of the great successes achieved by the seismic method in many parts of the world, such as: "Some 60 salt domes have been discovered in Texas and Louisiana, limestone anticlines and granite ridges have been located in the Near East, whilst faults, synclines and other tectonic features have been determined in coal-iron ore districts. One of the most striking applications was the accurate contouring of the surface of the Paleozoic rocks beneath the later looser strata in Holland."--W. Ayvazoglou.

SEISMIC PROSPECTING PATHS

By Maurice Ewing and L. Don Leet

Technical Publication 267, of
American Institute of Mining and Metallurgical Engineers,
Geophysical Prospecting No. 16, 1930, pp. 1-18

This paper gives a detailed theoretical discussion of the geometric path of a seismic impulse in a medium whose velocity is a linear function of the depth ($V = ay \quad 6$). Reflected as well as refracted paths at two adjacent strata of different elastic constant are discussed with great lucidity. It is regretted that data on customary curves of depth as opposed to distance has been omitted, as well as the factors of size of intrusion relative to depth and distance from shot point which control the limits of exploration sensitivity.--F. W. Lee.

BEMERKUNGEN ZUM NEUSEELANDBEBEN VOM 16 JUNI 1929

(REMARKS ON THE NEW ZEALAND EARTHQUAKE OF JUNE 16, 1929)

By V. Conrad

Zeitschrift fuer Geophysik, vol. 5, Nos. 5 and 6, 1929, 253-254

The perfect diagram of the New Zealand earthquake of June 16, 1929, drawn by the Vienna Earthquake Station, gave rise to the author's investigation of the question, whether or not the "Frankfurt time curves" published recently by B. Gutenberg in his work "Handbuch der Geophysik" can be brought into accord with the mean values of the distance of the epicenter. In this article Conrad shows that there is a possibility of establishing the distance of the epicenter by using a simple approximate proceeding, based on the calculations of the time curves derived. The way of finding this distance proves the correctness of the assumption on the constitution of the earth which served for the calculation of the time curves, thus making the determination of the path and the velocity of the wave rays possible.--W. Ayvazoglou.

A GRAPHICAL DETERMINATION OF THE POSITION OF THE HYPOCENTER OF AN EARTHQUAKE AND THE VELOCITY OF PROPAGATION OF SEISMIC WAVES

By Ryūtarō Takahashi

Bulletin of the Earthquake Research Institute, Tokyo, vol. 6, 1929, pp. 231-244

The present paper deals with a new method of graphical determination of the position of the hypocenter of an earthquake from the seismometrical data obtained at four stations, leaving the velocity of propagation of seismic waves as unknown.

The method is based on the geometrical property that the locus of the point, whose distances from three given points remain in given ratios, is a straight line, and the line passes through the outer center of the triangle having its vertices at three given points.

The method has its own merits in that it can be effective in a possibly short time without any tentative method. It is specially fitted for the search of the positions of the hypocenters of the after-shocks of a great earthquake. As an example of such a case, the positions of the hypocenters of the after-shocks of the great Tango earthquake (Japan May 7, 1927) were determined.--Author's abstract.

REPORT ON THE ACTIVITY OF THE EARTHQUAKE RESEARCH INSTITUTE, TOKYO, IMPERIAL UNIVERSITY, 1925-1929

By Chuji Tsuboi

Gerlands Berträge zur Geophysik, vol. 23, No.4, 1929, pp. 430-441

This interesting report on the activity of the Institute was prepared by Tsuboi at the request of Prof. Dr. V. Conrad, editor of Gerlands Berträge. In the preface the author gives a brief account of the scientific organization and the activity of the Institute in its early days. The next section dealing with investigations completed before 1929 is followed by a description of the investigations of the great Tango earthquake of 1927. In the last section, "Investigations carried out in the first half of 1929," the author describes the achievements of Japanese scientists in the work directed toward solving the problem of how the earth crust would behave under a force of long duration. This problem has been attacked by them from many different directions.--W. Ayvazoglou.

LES TRAVEAUX DE PROSPECTION EN POLOGNE

(PROSPECTION WORK IN POLAND)

By Jean Fevre

La Revue Pétrolifière, No. 353, 1930, pp. 9-10

The addition of geophysical methods of prospecting to the prospection work in Poland has been decided upon, and first investigations have been started in the region between the Stryj and Swica, to the north and south of the Daszawa. The seismic method has been adopted. The results obtained from the work carried on during the summer and the fall will be published in the near future.—W. Ayvazoglou.

ZUR FRAGE DER LAUFZEITKURVEN

(CONCERNING THE QUESTION OF THE TRAVEL-TIME CURVES)

By Gerhard Krumbach

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 303-314

The mean travel-time curves published previously are corrected, based on the 68 earthquakes which occurred during 1924. A comparison of the new travel-time curves with those observed during several other earthquakes shows that their deviations do not correspond one with another in case the regions of the epicenters are different and that these deviations are even different in case of earthquakes having the same places for the epicenters. These differences are explained by the relationship between the depth of the epicenter and the geological structure of the region of the epicenter.—Author's abstract, translated by W. Ayvazoglou.

4 - ELECTRICAL METHODS

ELECTRICAL-RESISTANCE METHOD OF GEOPHYSICAL SURVEYING

By G. T. Tagg

Canadian Mining Journal, Vol. 50, No. 49, 1929, pp. 1156-1159

After mentioning in a brief introduction some geophysical methods of prospecting (gravimetric, acoustic and seismic, and electrical) Tagg describes more detailed the electrical-resistance method.

The description and the use of Wenner's method of measuring the specific resistance is given briefly and its defects (polarization at the electrodes, stray currents, etc.) noticed. The introduction of an apparatus developed by Gish and Rooney by which some previous defects have been eliminated and generally satisfactory results obtained is mentioned.

The last part of the article deals with the Megger earth resistance tester, an apparatus which may be used for the same test but which is more convenient, as it combines generator, commutators and, measuring instrument in one portable case. Its considerable advantages consist of being self-contained and readily portable, simple to use, and direct reading.

A diagram of connections of the megger is given in a figure. A number of surveys, mainly in America, have been carried out with the megger and the results agree with those obtained with the Gish and Rooney apparatus. The instrument has been used by Dr. F. W. Lee, of the United States Bureau of Mines in a survey carried out by him and described in United States Bureau of Mines Technical Paper 440, Measuring the Variations of Ground Resistivity with a Megger.

Tagg concludes that although this description does not pretend to be an exhaustive exposition of the electrical resistance method of geophysical surveying, it does indicate a method which is one of the simplest of the many methods available and does not necessarily require the services of skilled personnel in obtaining the actual results.--W. Ayvazoglou.

GEOPHYSIKALISCHE FELDMESSUNG MIT NIEDERFREQUENTEN WECHSELSTRÖMEN

(GEOPHYSICAL FIELD MEASUREMENTS BY MEANS OF LOW-FREQUENCY ALTERNATING CURRENTS)

By Max Müller

Zeitschrift fuer Geophysik, vol. 5, No. 5 and 6, 1929, pp. 256-259

In this article Müller describes proceedings for making geophysical field measurements by using alternating currents of low frequency, of about 50 cycles, in order to avoid the disadvantages caused by alternating currents of from 400 to 500 cycles (influence of secondary currents induced by magnetic alternating field). Measurements have been made in the Meggener barite-pyrite deposits in Sauerland. The low-frequency alternating current has been taken directly from the lighting lines and directed through a transformer to the two electrodes connected with the earth. The receiving apparatus consisted of an induction frame, a booster, and a rectifier provided with a galvanometer.

A description of the instruments and a picture of the induction frame are given.

The results of the measurements are shown in a figure. The author describes also the experiments made on the anisotropic influence of media upon the distribution of low-frequency alternating currents.--W. Ayvazoglou.

DER SCHEINBARE SPEZIFISCHE WIDERSTAND BEI VIER PLAN-PARALLELEN SCHICHTEN

(THE APPARENT SPECIFIC RESISTANCE IN CASE OF FOUR STRATA THE PLANES OF WHICH ARE PARALLEL)

By J. N. Hummel

Zeitschrift fuer Geophysik, vol. 5, Nos. 5 and 6, 1929, pp. 228-238

The purpose of this article is to show how the apparent specific resistance may be exactly calculated for homogeneous underground covered with two strata, of any conductivity and any thickness, the planes of which are parallel. (See Abs. 9, Hummel, The Apparent Specific Resistance.) Hummel derives formulas for some special cases on the assumption that all the four layers have any resistance whatsoever (the air above the surface of the earth is considered to represent a layer also.) The corresponding curves are drawn and given in figures. The graphic proceeding is explained and may be used with sufficient accuracy for the determination of curves of any amount of parallel strata, as the calculations of formulas for more than two covering strata become very complicated. Various tests have shown that the apparent specific resistance may be used as an excellent indicator of the character of the underground stratified horizontally. The interpretation requires, of cource, great experience and theoretical knowledge.--W. Ayvazoglou.

VERSUCH EINER ELEKTRODYNAMISCHEN DICKENMESSUNG VON GLETSCHEREIS

(EXPERIMENTS IN ELECTRODYNAMIC MEASUREMENT OF THE THICKNESS OF GLACIER ICE)

By Walter Stern

Gerlands Beiträge zur Geophysik, vol. 23, No. 3, 1929, pp. 292-333

After developing the relations between the capacity of a conductor of electricity and the depth of a stratum differing sufficiently from its surroundings in its electrical conductability or its dielectrical-constant, a method is described by which the depth of such a stratum (identical with thickness of the covering stratum lying above it) can be determined according to the relations.

In performing the conditions, which are necessary for the validity of the relations and for the applicability of this method by the ice and the glacier bottom, the question of the usefulness of the method in determining the thickness of glacier ice can be affirmed -- but at first only theoretically.

The results of the experiments made by the author on a glacier of the central east Alps, the execution of which and the apparatus is fully reported, ought to have confirmed the result of the theoretical researches and have proved the applicability of the method for the determination of the thickness of glacier ice.

It is highly likely that this method may in principle--although in a changed form and with improved measuring-instruments--be employed for measuring inland ice.--Author's abstract.

DIE VERWENDUNG DER ELEKTRIZITÄT ZUR ERFORSCHUNG DES UNTERGRUNDES

(THE USE OF ELECTRICITY FOR THE EXPLORATION OF THE SUBSOIL)

By H. Haalck

Gerlands Beiträge zur Geophysik, vol. 23, No. 3, 1929, pp. 99-143

After briefly describing in a preface the fundamental principles of electrical methods of prospecting based on the difference in conductivity of rocks and discussing the special place occupied by these methods amongst the other methods (gravimetric, magnetic, seismic), the author summarizes the physical problem in the development of the electrical methods of prospecting as follows:

"By means of which kind of current, supplied in what manner, and by what method of measurement can the distribution of current in a spatial conductor, as represented by the subsoil, be determined in the most suitable and surest way?"

The work is divided into the following headings:

A. The use of direct current.
   1. Methods of measurements.
   2. Natural earth currents.
      (a) The natural potential of ore deposits.
      (b) The "turbulent" earth currents.
   3. Direct current produced artificially.
   4. Measurements of resistance.
B. The use of alternating current.
   5. General possibilities.
   6. The equipotential line proceeding.
   7. Electromagnetic methods of measurement.
   8. Phase-displacement measurements.
   9. Influence and arrangement of the network.
   10. Induced current, electrodynamic wave method.
      (a) Induced current.
      (b) The electrodynamic wave method.

A detailed description of all the headings, illustrated by a series of diagrams, is given.

In conclusion, Haalck analyzes the geological points of view and the difficulties arising during the practical application of the methods. A scheme representing the electrical methods of prospecting is given. The methods having a practical importance are printed in larger type.

Tables showing the conductivity of ores and rocks are added.

In the last part of the article Haalck expresses his opinion on the search for oil by means of electrical methods: "Only under favorable conditions, but which are never known in advance, may the electrical methods of prospecting be of a real aid to the oil-geologists."--W. Ayvazoglou.

ELECTRICAL PROSPECTING OF MINERAL DEPOSITS BY THE METHOD OF EQUIPOTENTIAL LINES

(In Russian)

By J. N. Lepeshinski and D. Th. Murashow

Comité Géologique, Matériaux pour la géologie général et appliqué,
vol. 138, Leningrad, 1929, 128 pages.

This publication is one of the series of books on the methods of geophysical prospecting issued by the Geological Committee in Leningrad. (See Geophys. Abs. No. 7 - V. Fredericks.)

The purpose of this book is to describe the practical application of the theory of geophysical prospecting by the method of equipotential lines.

The book is divided into two parts. In the first part the authors describe the apparatus used, as well as the preliminary operations necessary for carrying out the method; in the second part, the influence of various factors upon the character of the results obtained is examined and the experience of field parties showing how the best results may be achieved for each case is described.

The results obtained by the electrical method of prospecting are in many cases verified by the pamphlet, and a list of literature is added. The contents of the book are as follows:

Part I.	Chapter 1.	Apparatus for producing the artificial electromagnetic field in the ground.
	Chapter 2.	Instruments for the investigation of the artificial electromagnetic field.
	Chapter 3.	Preparation of the area and the individual processes of investigation.
	Chapter 4.	Topographic survey of the area under investigation.
Part II.	Chapter 1.	Conditions under which the method of the equipotential lines should be used.
	Chapter 2.	Several cases of the aspect of equipotential lines.

Chapter 3. Interpretation of the results.

Chapter 4. Description of typical areas.

Chapter 5. Historical review of the developments of electrical methods of prospecting in the Geological Committee.

--W. Ayvazoglou.

DIE ANWENDUNG DES KOMPLEXEN WECHSELSTROMKOMPENSATORS BEI GEOELEKTRISCHEN UNTERSUCHUNGEN

(THE USE OF THE COMPLEX ALTERNATING-CURRENT COMPENSATOR FOR GEOELECTRIC INVESTIGATIONS)

By Wilhelm Geyger

Prospector-Institut fuer practische Geophysik und
Geologie, vol. 23, 1929, pp. 109-113

In a brief introductory note Geyger mentions the principles of measurement used in geoelectric methods of prospecting based on the difference of electric conductivity of ore bodies. After a brief explanation of these methods the author shows that the use of the complex alternating current compensator offers considerable advantages for geoelectric investigations.

The article is divided into the following sections:

1. Principles of measurement used for geoelectric investigations up to this time.
2. Representation of the distribution of current fields and magnetic fields in space by the deduction of the momentary fields.
3. Measurement of the momentary fields by means of the complex alternating-current compensator.
4. Application of the measurement arrangement to the measurements on the terrane.
5. Practical execution of investigations on the terrane.
6. Concluding remarks.

The pictures added show: (a) The principle of the compensation proceeding generally used in geoelectric methods of prospection with alternating current; (b) resolution of the probe or frame tension into two components (efficiency component and blind component) with a phase-displacement at 90°;

(c) principle of the new arrangement of connections for measurements by using Geyger's sliding-wire alternating-current compensator in connection with a current transformer; (d) phase relation in the measurement according to this new arrangement; (e) tension relations in the so-called circular measurement with constant distance of stake electrodes; (f) measurement arrangement for practical execution of geoelectric investigations on the terrane.--W. Ayvazoglou.

EINE NEUE HOCHFREQUENZMETHODE ZUR REGISTRIERUNG VON BODENERSCHÜTTERUNGEN

(A NEW HIGH-FREQUENCY METHOD FOR RECORDING VIBRATIONS OF THE GROUND)

By P. Liechti

Gerlands Beiträge zur Geophysik, vol. 23, No. 2, 1929, pp. 213-228

The construction and working of a new electric apparatus by which the vibrations of the ground can be measured is described. It consists essentially of a mass of mercury over which a metallic plate is placed. The arrangement works as a condenser in an absorbing circuit coupled to a high-frequency tube transmitter. The surface of the mercury acts then as a free vibratory membrane. The enclosed diagrams show the superposition of the ground-vibrations on those of the free membrane. The new apparatus is simple in construction and use and may easily be transported. Its high sensitivity can still be increased by cascades of low-frequency amplification.

This work is considered by the author to be a preliminary report, as the experiments have been stopped for various reasons. A long list of the literature used is added.--W. Ayvazoglou.

5 - RADIOACTIVE METHODS

FURTHER STUDIES ON RAYLEIGH WAVES HAVING SOME AZIMUTHAL DISTRIBUTION

By Katsutada Sezawa

Bulletin of the Earthquake Research Institute, Tokyo,
vol. 6, 1929, pp. 1-18

The paper consists of two parts. The first part deals with the problems concerning the transmission of waves on the surface of a semi-infinite solid body and the other treats of the propagation on a spherical surface. The principal results are enumerated as follows:

1. Rayleigh-waves having azimuthal distribution can be transmitted on the surface of a semi-infinite solid or a spherical surface without diffusion of displacements in each wave front.

2. Although in the case of the propagation of Rayleigh waves on plane surface, the nature of the vertical and the horizontal

components of displacement in wave profile and in azimuthal distribution is maintained for all distances, the azimuthal component of displacement quickly disappears as the distance from the origin increases, showing a nature quite different from the bodily elastic waves.

3. The law of pull and push is applicable even to the surface waves, under the restriction that the azimuthal component is out of consideration. This law is also valid in the case of the transmission of waves caused by the arbitrary disturbance.

4. When the disturbance acts on an interior point of the body the azimuthal distribution of displacement on the surface is in conformity with the motion of the source to a certain extent.

5. Even at the equatorial circle of the sphere, long Rayleigh waves, as affected by the curvature of the surface, have the azimuthal and the ordinary components of comparable magnitudes; in the vicinity of the seismic pole these waves have the large azimuthal component compared with the vertical and the radial components.

6. Short waves have the large azimuthal component only in the close vicinity of the seismic epicenter.--Author's abstract.

6 - GEOTHERMAL METHODS

DIE GEOTHERMISCHEN GRADIENTEN DES ALFÖLD

(GEOTHERMAL GRADIENTS IN ALFÖLD)

By Josef V. Sumeghy

Jahrbuch der Königlichen Ungarischen Geologischen Anstalt,
vol. 28, No. 3, 1929, pp. 276-370

In the brief preface of this work Sumeghy draws the attention of the readers to the fact that unfortunately not all of the territory of Alföld (the great Ungarian Plain) could be investigated. The geothermic gradients in the Croatian and Slavonian parts of Alföld, as well as in the Banat and Bacska, were not determined. This is especially regrettable owing to the fact that these parts have the greatest number of deep wells, thus the data obtained there would be of great value.

The work is divided into the following chapters:

1. Calculation of the depth stages.
2. Enumeration of the deep wells examined.

3. Reasons for the differences of the geothermal gradients in Alföld.
   (a) The different heat conductivities of the rocks.
   (b) The effect of tectonical causes.
   (c) The effect of heat originated by the decomposition of organic substances.
   (d) The effect of the occurrences of gas.
   (e) The effect caused by the air.
   (f) The effect caused by radium-emanations.
   (g) Other less important effects.
   (h) The influence of deep water.

4. The geothermical depth zones of the Alföld.
   (a) The first geothermal depth zone.
   (b) The second geothermal depth zone.
   (c) The third geothermal depth zone.
   (d) The fourth geothermal depth zone.

5. Relation of the geothermal gradients to the structure of the Alföld.
   (a) The normal geothermal gradient of the Alföld.
   (b) The higher and lower gradients.
   (c) The directions and breaking of lines which can be proved to be based on the lower gradients.
   (d) Transition zones.

A tectonic map of the Alföld and a large number of diagrams and tables are given. A list of 151 titles of the literature used is added.--W. Ayvazoglou.

7 - UNCLASSIFIED METHODS

GEOPHYSICAL WORK IN GREAT BRITAIN

By W. F. P. McLintock and James Phemister

Oil News, London, vol. 26, No. 877, Sept. 20, 1929, pp. 273, 276.

Journal of the Institution of Petroleum Technologists,
vol. 15, No. 76, 1929, pp. 563-568.

Owing to the considerable interest in physical methods of investigating subsurface geological structure and the fact that the results of this work, carried out principally by commercial companies, have not been published, the Director of the Geological Survey decided in 1927 to inaugurate a program of geophysical work in order to obtain exact and reliable information regarding the applicability of some of the methods to the solution of definite geological problems. The gravitational work of survey by means of Eötvös torsion balance was first investigated. After a brief description of the elements of the gravitational field, characteristics of areas most suitable for gravitational survey, and the methods of survey employed as depending on the type of structure to be investigated, the authors mention the places, selected mainly in areas where the geological elements were already fairly well known, in which the gravitational surveys have been completed (Swynnerton-Dyke, the buried channel of the River Kelvin at Drumry, and the Pentland Fault in the Edinburgh district), and conclude that the experience of the Geological Survey with the Eötvös torsion balance has shown that the method is of considerable value in geological investigation.

The first field test by means of magnetic work has been carried out by A. F. Hallimond over the Swynnerton Dyke; this structure was previously investigated with the torsion balance. Further work, with promising results, is now in progress in the Melton Mowbray district, Leicestershire.

According to the authors there are no published records of seismic or electrical surveys in Great Britain, although such work is being carried out by private companies. A Geophysical Research Committee has recently been appointed for the purpose of encouraging and developing research in the various methods, which, in the opinion of the authors, will become of increasing importance in geological investigations.--W. Ayvazoglou.

ESSENTIAL POINTS IN USE OF GEOPHYSICS

By E. U. von Buelow

The Oil and Gas Journal, vol. 28, No. 33, 1930, pp. 34, 67-68, 104.

In this article von Buelow briefly outlines some of the possibilities of the present geophysical methods and devices and explains where the difficulties in their application are and under which conditions the methods will be of real economic value.

The geophysical methods are divided by the author into two fundamentally different branches:

1. Measurement of natural forces and properties in the earth's field which always are present and beyond our control or influence (gravimetric, magnetic, self-potential-electric, radioactive, and geothermic methods);

2. Measurements of artificially created forces which to a certain degree can be controlled by us (seismic and electrical methods).

The advantages and disadvantages of each of these methods, possible interferences, and their commercial value are discussed and conclusions concerning each method are drawn.

Summarizing all the foregoing investigations, the author is of the opinion that they reveal the fact that for structural studies and studies of the exact shape and position of salt domes, etc., the seismic method of measuring the acceleration of the ground particles is the most reliable and speediest, therefore the most economic of to-day. Aside from the still unknown possibilities of the electrical methods, the author considers the torsion-balance method to be next, whereas the magnetometer should be applied very carefully and as a rule only for checking another method.

The author also recommends changing the commercial valuation of geophysical methods entirely; until now this was more or less calculated from the amount of acreage covered in a definite period of time and based on the costs per acre surveyed. More stress should be laid on the results obtained.--W. Ayvazoglou.

LES MÉTHODES DE PROSPECTION GÉOPHYSIQUE. LA PROSPECTION DU PÉTROLE

(METHODS OF GEOPHYSICAL PROSPECTING. PROSPECTING FOR OIL)

By B. Sergescu

Annales des Mines de Roumainie, vol. 12, Nos. 10, 11, 12, 1929,
pp. 471-481, 523-530, 575-582.

In a series of articles Sergescu discusses geophysical methods of prospecting. The gravitational method, its principles and the instruments used, is described in the first part of the series. The second part deals with the magnetic methods, and the third with electrical methods (direct current, alternating current, inductive method, Elbof's method). Description of the other methods is to be given in the next issues of the same magazine. The articles are provided with many diagrams.—W. Ayvazoglou.

GEOPHYSICAL METHODS OF PROSPECTING IN THE UNION OF THE SOCIALIST SOVIET REPUBLICS

By B. Numerov

Bulletin of the American Association of Petroleum Geologists,
vol. 14, No. 1, 1930, pp. 93-98.

Different institutions and corporations in Russia which use geophysical methods of prospecting are enumerated. The results of their theoretical and practical investigations have been published in various papers (Russian: Geological Committee, the Institute of Applied Geophysics, the Journal of Oil Operations of the U.S.S.R., the Academy of Science of the U.S.S.R., the Astronomical Institute in Leningrad; German: Zeitschrift fuer Geophysik).

Numerov mentions in particular the following investigations accomplished in the field, as well as theoretical work in connection with the gravitational method:

1. The effect on the gravitational field of masses of regular shape.

2. Analytical and graphic methods of calculating terrane effects.

3. Investigation of the particular case of a single limiting surface.

4. The design of a gravitational variometer with three beams.

5. Observations on Lake Shouvalovo and other tests of the same kind.

A summary of the progress of the gravitational work carried out for prospecting for salt, oil, coal, and iron ores is given:

Salt. The investigations carried out during the period from 1926 to 1929 have shown that in potash-bearing formations of the North Ural Mountains (near Solikamsk) the isogam maps give a complete account of the structure of the salt strata.

Oil. The observations of 1927-1929 led to the discovery and further study of anticlines of foraminiferal limestone formations on the western coasts of the Caspian Sea in Dagestan.

Coal. The observations of 1929 have shown the importance of a general gravitational reconnaissance for the purpose of the study of the extension of the Donetz coal district.

Iron. The pendulum observations in the district of Krivoy Rog supplied new and important data concerning the geological structure of the region and have shown the presence of a second anticline at a distance of about 10 kilometers from the first.

Tables and gravity map of the Novobogatinsk salt dome, Ural-Emba district, are added to the article. In conclusion, Numerov mentions the first attempts made in Russia for the application of the seismological and electrical methods for the study of geological structures.--W. Ayvazoglou.

GEOLOGICAL PROSPECTING FOR OIL STILL IN RESEARCH STAGE

By William F. Lowe

National Petroleum News, vol. 21, No. 47, 1929, pp. 59-63

The important part of geophysics in petroleum exploration, although proved to be of great value, can not yet be considered anything other than a geologic guide. The findings of the magnetometer, torsion balance, seismograph, and the various electrical methods of geologic exploration, have a very definite value when properly interpreted. A clear understanding of the value is necessary before a conclusion can be reached concerning subsurface conditions. These instruments can but indicate certain irregularities in the local geological section and can not be considered oil finders. The author draws attention to the growing appreciation of the value of micropaleontology. In connection with geophysics by which the structure may be outlined it remains for the paleontologist to furnish the more accurate geologic data.--W. Ayvazoglou.

DEVELOPMENT IN SCIENCE OF GEOPHYSICS

By C. A. Heiland

The Oil and Gas Journal, Oct. 10, 1929, pp. 186-190 and 274

In this article Heiland gives a brief description of the development in science of geophysics in Germany which he had opportunity to study during his recent visit to that country. The article is divided into the following parts:

1. Activities of State institutions and scientists connected with such institutions.

2. Activities of consulting companies.

3. Manufacturers of instruments.

Among State institutions the geophysical department of the state geological survey under the direction of Dr. Kuehn occupies the main place. The department has, as far as the author knows, one torsion balance, three magnetometers, three seismographs, and some electrical equipment. Geophysical work carried out by this department during the last year is mentioned in the article. The two other State institutions actively engaged in geophysical prospecting are the Geodetic Institute and the Magnetic Observatory in Potsdam. Both of these institutions work in close cooperation with the Geological Survey.

The Geophysical Institute in Goettingen and the scientists taking part in the work of this Institute are mentioned. The names of well-known scientists conducting the research work in Germany are given and the work on which they are mainly engaged is described. In concluding the first part of the activities of scientific institutions and individuals engaged in geophysical prospecting, Heiland adds a list of literature on prospecting published in Germany.

According to Heiland the number of consulting companies in Germany is comparatively small. There are only two major companies. The "Seismos" which was combined with the "Exploration" some time ago, and the "Elbof" (Piepmeyer). The "Prospection" (Dr. Ambronn) operates at present on a much smaller scale than the two companies first mentioned. There exist two or three more prospecting companies, but they have not attained much significance. The methods used by the different companies and their work are mentioned.

In the last part, "Manufacturers of Instruments," the Askania-Werke in Berlin is put in the first place, being by far the largest company. The kinds of instruments manufactured by this company are enumerated. A few smaller companies such as the Topfer Co. in Berlin, the Haff Co. in Bavaria and the Spindler and Hoyer Co. in Goettingen are added to the list of manufacturers of geophysical instruments.--W. Ayvazoglou.

8 - GEOLOGY

ZUR ERFORSCHUNG DER ERSTEN 100 KM. ERDKRUSTE

(ON THE INVESTIGATION OF THE FIRST 100 KILOMETERS OF THE EARTH'S CRUST)

By J. Koenigsberger

Zeitschrift fuer Geophysik, vol. 5, No. 7, 1929, pp. 289-299

In a lecture delivered by Koenigsberger during the session of the German Geophysical Society which was held in Dresden from October 3 to 5, 1929, the author points out that interest in the knowledge of the earth's crust is not limited to science only but is important also from the general cultural and economic viewpoint. The author gives a brief report on the static picture of the upper earth's crust based on the known facts and researches made by a series of scientists.--W. Ayvazoglou.

ORIGIN OF HELIUM-RICH NATURAL GAS

By R. C. Wells

Journal of the Washington Academy of Sciences,
vol. 19, No. 15, Sept. 19, 1929, pp. 321-327

Measurements of the separation of hydrogen from carbon dioxide obtained by fractional diffusion through ball clay were made to illustrate a process by means of which natural gas may become enriched in helium in the earth. The bearing of this theory on other theories of the origin of such gas is discussed.

The rate of diffusion of several other gases through ball clay was also measured, and several problems are mentioned for further study.--Author's abstract.

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